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## Flashing member with adaptable corner segments

The present invention relates to sheet flashing members for frame structures of roof windows or 5 similar roof penetrating building structures.

When flashing roof penetrating building structures, for example chimneys or frame structures for roof windows, in order to protect them from the weather and to provide a seal between the structure 10 itself and the roof, it is common to use flashing covers of rigid materials such as metal or hard plastic like PVC and in particular sheet metal, for instance aluminium, copper, steel or zinc. Conventionally, such flashing covers have been 15 manufactured by ordinary tin man work from a plane sheet material which is profiled and formed to make a fit at the desired location.

The comparatively costly adjustment and assembly work on location, which is required when using this 20 conventional craftsmanship, may be avoided by use of pre-manufactured flashing members. When these flashing members are used with, for example, a standard window type mounted in a given roof surface, it is possible to use the same "standard" flashing 25 members regardless of, for example, the slope of an inclined roof surface.

Typically, a flashing assembly adapted to be used between, for example, a roof window and a sloping roof surface comprises upper and lower flashing 30 members adapted to be mounted in a horizontal position between the roof surface and the upper and lower frame portions of the window, respectively, as well as first and second side flashing members

adapted to be mounted in a sloping position between the two side frame portions of the window and the roof surface. Such a flashing assembly further comprises corner segments adapted to provide a seal  
5 between the side flashings and the upper and lower flashings, such corner segments often being integrated in either the upper and lower flashing members or the side flashing members.

However, some types of flashing members are not  
10 "standard" as they are dependent upon, for example, whether a single window is mounted in a roof surface or if two or more windows are mounted in neighbouring relationship. In this case special flashing members are used to provide a seal between two neighbouring  
15 windows. A further problem in this context is the need to provide different flashing members for neighbouring windows mounted with different spacing there between. For example, the present applicant markets four different widths for such flashing  
20 members.

DK-B 154 099 discloses a flashing element assembly comprising elements specifically adapted for sealing between two neighbouring windows. Especially, two different lower flashing members are used in order to  
25 provide a seal between the lower neighbouring corners of the windows.

Although the upper and lower flashing members essentially serve the same purpose of providing a seal between the roof window frame and the  
30 surrounding sloping roof surface, the two flashing members are adapted to fulfil their function in two rather different ways. The upper flashing member is normally formed as a gutter-like member with a flange

adapted to be mounted on the upper window frame and a sheet portion adapted to be mounted under the roof surface. When water flows down the sloping roof surface and onto the upper flashing member, the gutter directs the water outwards towards the gutters of the side flashing members. In contrast, the lower flashing member is adapted to provide a seal between the lower window frame portion and the upper surface of the roof such that water entering the space between the window and the roof is directed outwards and/or downwards onto the outer surface of the roof. Further, the lower flashing member also serves to deflect the water led downwards from the side gutters for which reason the lower flashing is normally somewhat wider than the combined width of the window and the two side flashing members, the additional width being provided by the corner segment allowing the water to flow to either side when coming from the side gutter.

As follows from the above, the corner segments adapted to be used between a window and the surrounding roof is not suitable for use between two neighbouring windows, which normally will be placed relatively close to each other.

The object of the present invention is to provide a sheet flashing member which provides for a standardized and cost-optimised production, which may easily be adapted to different installation situations and in which the risk of incorrect mounting and insufficient sealing between the roof penetrating structure and the surrounding roofing is substantially reduced.

This and further objects are met by the provision

of a flashing member of the kind mentioned in the introduction and which is characterized in that at least one of said corner segments at a surface thereof comprises at least one indication indicating  
5 a pattern, such that at least a part of the sheet section may be separated from the remaining part of the flashing member along the indications in order to transform the respective corner segment from an initial state to a transformed state.

10 Although it may be possible to adapt a given standard flashing member for a desired purpose by using conventional craftsmanship, the present invention allows such an adaptation to be performed by merely selecting between, for example, two  
15 different configurations for a corner segment, e.g. whether it is to be used between a window and the surrounding roof or between two neighbouring windows. By the term "selecting" is meant that the corner segment may easily be modified in order to adapt to  
20 the desired purpose.

By providing at least one of the corner segments with such an indication, one and the same flashing member may be used regardless of whether it is to be used in connection with a single roof penetrating  
25 structure or roof penetrating structures installed side-by-side.

The indication may comprise a visual indication in the shape of at least one longitudinally extending line or a longitudinally extending row of dots, short  
30 sections etc.

In a preferred embodiment the indication or indications comprise weakening sections, preferably in the form of one or more grooves provided on the

surface of a sheet material portion of a corner segment for a flashing element. It is to be noted that the wording "a groove provided on the surface" is intended to define a substantially "non-grooved" area with a clearly distinguishable groove, this in contrast to, for example, a corrugated material which essentially is made up of grooves. The groove structure serves as a combined aid, i.e. providing both a guide "where to separate" and a guide for the tool performing the separation *per se*. When the sheet flashing is made of a material which will break and separate relatively easily under a bending operation, merely scoring the material along the groove with a knife or similar instrument will allow for easy separation, i.e. a light scoring followed by some bending back and forth will result in separation along the groove. A suitable material allowing for this operation would be aluminium, which is also traditionally used for roof flashing members.

In a further development of the above preferred embodiment the groove is formed as a simple depression, which can advantageously be performed during manufacture as part of the cutting and bending procedures, however, it may also be formed between raised portions just as it may be formed on either side of the flashing member.

In an especially preferred embodiment, one of the corner segments comprises an indication arranged at an oblique angle relative to the general longitudinal orientation of the flashing member. The oblique indication may be directly or indirectly connected to a free edge of the corner segment. The oblique indication allows the corner segment to be arranged

corresponding to a corner of, for example, a roof window.

Although the flashing member is advantageously used as a lower flashing member, the principles of  
5 the present invention may be used for upper as well as side flashing members in order to provide adaptable corner segments.

When in the context of the present application the terms "upper" and "lower" as well as "vertical" and  
10 "horizontal" are used, they refer to structures in their mounted state, however, to the skilled person this will also be evident for the flashing members *per se*. The terms "left" and "right" merely refer to the situation shown in the Figures.

15 Other objects and advantages of the present invention will become apparent and obvious from a study of the following description, in which the invention will be explained in greater detail with reference to the schematic drawings, in which

20 Fig. 1 shows a lower flashing member seen from above,

Fig. 2 is a perspective view showing in partial a pair of roof windows with a first, left-most lower flashing member arranged there between, and

25 Fig. 3 is a perspective view showing the roof windows and flashing member of Fig. 2 with a second right-most lower flashing member mounted.

With reference to Figs. 1-3 a preferred embodiment of a flashing member according to the invention will  
30 be described.

Fig. 1 shows a lower flashing member 1 adapted to be mounted in a horizontal position between a roof surface (not shown) and a lower frame portion of a

window (not shown), i.e. the portion of the window frame comprising a bottom piece and two adjacent side pieces. The flashing member comprises a rail element generally designated 40 adapted to engage a lower 5 portion of a window frame and a skirt element 50 attached to a lower edge 13 of the rail element 40 and adapted to engage the upper roof surface. The rail element 40 comprises a sheet section including a main portion 10 as well as left and right corner 10 segments 20, 30 arranged substantially in the same plane and adapted to be mounted in parallel with the general slope of the roof. The main portion 10 comprises an upstanding lower flange 11 adapted to engage an outwards facing surface of the window frame 15 bottom piece, and the corner segments comprise left and right corner flanges 21, 31, respectively, adapted to engage the lower portions of the outwards facing surfaces of the window frame side pieces. In the shown embodiment a top flange 12 is provided in 20 order to engage an upwardly facing surface of the window frame bottom piece.

The rail element 40 may be made from sheet metal or any other suitable material having substantially corresponding technical properties.

25 A flashing member comprising the above described features and having a general outline as shown in Fig. 1 is adapted to be used in combination with a roof window being mounted solitarily in a roof surface.

30 However, corresponding to the present invention, the corner segments 20, 30 of the flashing member 1 are provided with means allowing them to be modified for use in combination with neighbouring lower

flashing members on either the left or right side or on both sides. It is normally desirable to mount neighbouring roof windows relatively close to each other, which would be contrary to using normal  
5 flashing members which are primarily adapted to be used between a window and the roof and which, when combined with each other, would provided a very wide flashing between two windows.

Therefore, when using a lower flashing member of  
10 the general type described above, the neighbouring corner segments will have to be modified, i.e. for any given pair of windows arranged side-by-side a left and a right corner segment for the neighbouring lower flashing members would have to be modified to  
15 fit between the two windows. Further, in order to properly provide a sealing function, at least one of the modified corner segments should preferably be provided with flange portions engaging both of the neighbouring windows.

20 Accordingly, the corner segments 20, 30 of the flashing member 1 are provided with additional means which allows them to be easily and securely adapted for the desired purpose. As shown, each of the corner segments 20, 30 are provided with a pattern of one or  
25 more indications, in the embodiment shown in the form of stamped grooves, the grooves providing, as described in the introduction, both a separation guide and a separation aid.

Each indication may be provided as a solely visual  
30 indication, but preferably comprises a weakening section, e.g. in the form of a groove as described in the above. In an alternative embodiment (not shown), the weakening sections may comprise a longitudinally



extending cord member accommodated in the corner segment. This corresponds in substance to the principle used in connection with e.g. cans for food, biscuit packages etc.

5       More specifically, in the embodiment shown the left corner segment 20 is provided with a single groove 22 arranged substantially perpendicularly to the lower edge 13 of the rail element 40, the groove 22 fully spanning the width of the left corner  
10 segment 20 between an upper edge 23 and the lower edge 13. In this way, the left corner segment 20 can be divided into two portions and allowing the left-most portion 26 to be removed. In case a skirt element 50 is provided, the left-most portion 26 is  
15 simply removed from the skirt portion at the attachment between the skirt portion and the rail element 40, or the skirt element 50 may be cut along a line corresponding to an extension of the groove 22.

20       In the embodiment shown, the right corner segment 30 is provided with a slightly more elaborate pattern of indications in the form of grooves allowing the corner segment 30 to be brought into a configuration, in which a number of corner engaging flanges are  
25 provided to engage the corner of a neighbouring roof window. As seen, the right corner segment 30 comprises a first groove 32 extending from a free upper edge 33 as well as a second groove 34 extending from a free side edge 35, the two grooves 33, 34  
30 being arranged substantially perpendicularly to each other and meeting in a corner 36 thereby defining a substantially rectangular portion 37 which can be removed, corresponding to the above-described removal

of the left-most portion 26, as will be described in greater detail below. Starting from the corner 36 is provided an obliquely arranged groove 38 extending, for example, at an angle of  $45^\circ$  towards the lower edge 5 13 of the rail element 40. When the rectangular portion 37 has been removed, the remaining portion of the right corner segment can be split along the oblique groove 38.

With reference to Figs. 2 and 3 it will be 10 described how a pair of two lower flashing members, each configured as described with reference to Fig. 1, can be modified to provide a set of correspondingly mating corner segments for a pair of windows mounted in close side-to-side relationship, 15 which in the shown case means that a right corner segment of a left-mounted lower flashing member is adapted to mate a correspondingly adapted left corner segment of a right-mounted lower flashing member. In the following like reference numerals are used to 20 denote like structures for the two flashing members as in Fig. 1, with 100 respectively 200 added.

With regard to the separation action by means of the grooves, this step is preferably performed as described above, i.e. after scoring the grooves with 25 a knife or similar instrument followed by some bending back and forth, and separation will subsequently take place along the grooves.

In Fig. 2 is shown in partial a pair of roof windows, with a first left-most window 300 comprising 30 a frame 301 and a second right-most window 400 comprising a frame 401, the windows being mounted in an inclined roof surface with a predetermined

distance between the neighbouring side pieces of the respective window frames, the lower flashing members being configured to fit this predetermined distance. A first, left-most lower flashing member 101 5 comprises a rail element 140 with a main portion 110 as well as a right corner segment 130. The main portion 110 comprises an upstanding lower flange 111 and the right corner segment comprises a flange 131 (not visible), the flanges 111, 131 being connected 10 by a top flange 112. As can be seen, the flashing member 101 has been arranged in the plane of the roof and around the first window 300, the flanges 111, 131, 112 engaging the window frame 301. In comparison with the configuration shown in Fig. 1, the 15 rectangular portion 37 has been removed and the corner segment 30 has been separated along the oblique groove 38, leaving corresponding free edges 132, 134, 138a and 138b on either side of the groove. Edge portions of the right corner segment 130 have 20 been bent along lines (shown in dot-and-dash) extending substantially in parallel with the free edges 134 and 132 to provide first and second secondary flanges 141, 142 extending substantially perpendicularly to the general plane of the corner 25 segment 130, the first corner flange 141 engaging a lower portion of the outwards facing surface 420 of the bottom piece of the right window frame, and the second corner flange 142 engaging a portion of the outwards facing surface 410 of the side piece of the 30 right window frame.

Fig. 3 shows in partial the pair of roof windows as well as a part of the left-most lower flashing member 101 as shown in Fig. 2, however, a second,

right-most lower flashing member 201 comprising a rail element 240 with a main portion 210 as well as a left corner segment 220 has been added. The main portion 210 comprises an upstanding lower flange 211 and the left corner segment 220 comprises a flange 221, the flanges being connected by a top flange 212. Corresponding to Fig. 1, the left corner segment 20 has been split along the groove 22 and the left-most portion 26 has been removed together with the corresponding part of the rail element 250, this leaving a corresponding free edge 122. As can be seen, the second flashing member 201 has been arranged in the general plane of the roof and the first flashing member 101 and around the second window 400, the flanges 211, 221, 212 engaging the window frame 401. In this way the corner flanges 141, 142 (see Fig. 2) have been covered by the second flashing member and are now positioned between the second frame 401 and the flanges 211, 221, respectively. In the area between the two windows 300, 400, the major portion of the right corner segment 130 and corresponding part of the skirt element 150 of the right-hand flashing member 101 have been covered by the left corner segment 220 and the corresponding part of the skirt element 250, the free edge 122 being positioned along the flange 131 (see Fig. 2) of the first flashing member 101.

As follows from the above, a flashing member has been provided which allows the "do-it-yourself" person to easily and fail proof modify the corner segments of two flashing members in order to fit a pair of roof windows arranged in a side-by-side relationship using a single type of lower flashing

member.

Whereas the present invention has been described with respect to a preferred embodiment thereof, it will be understood that various changes  
5 and modifications will be suggested to one skilled in the art and it is intended to encompass such changes and modifications as fall within the scope of the appended claims. For example, in the shown embodiment a lower flashing member having different corner  
10 segments at each end thereof is shown, however, a flashing member in accordance with the present invention may also be in the form of an upper or a side flashing member, just as the flashing member may be provided with adaptable corner segments at one or  
15 both ends, and in the latter case, comprising identical or different corner segments. Further, in the shown embodiment, a pattern of indications for a single predetermined spacing between the neighbouring roof windows is shown, however, it would be within  
20 the scope of the present invention to provide a number of such indications allowing the user to choose between two or more distinct applications, e.g. spacing between the window frames.

## P A T E N T     C L A I M S

1. A sheet flashing member (1) comprising:  
a sheet section (40) defining a plane and having first and second corner segments (20, 30),  
5     at least one flange (11, 21) arranged at an angle relative to the plane of the sheet section and adapted to engage a surface of a roof penetrating building structure, c h a r a c t e r i z e d in that  
10     at least one of said corner segments at a surface thereof comprises at least one indication (22, 32, 34, 38) indicating a pattern, such that at least a part of the sheet section may be separated from the remaining part of the flashing member along  
15 the indications in order to transform the respective corner segment from an initial state to a transformed state.
2. A sheet flashing member as defined in claim 1, wherein each said indication (22, 32, 34, 38)  
20 comprises a visual indication in the shape of at least one longitudinally extending line or a longitudinally extending row of dots, short sections etc.
3. A sheet flashing member as defined in claim 1,  
25 wherein each said indication (22, 32, 34, 38) comprises a weakening section.
4. A sheet flashing member as defined in claim 3, wherein said weakening sections includes at least one groove.
- 30     5. A sheet flashing member as defined in claim 4, wherein said groove is formed by depression.
6. A sheet flashing member as defined in claim 3, wherein said weakening sections comprise a

longitudinally extending cord member accommodated in the corner segment (20, 30).

7. A sheet flashing member as defined in any of the previous claims, wherein the pattern defines one or more indications delimiting an area (26, 37) of the end portion (20, 30) which, when separation has taken place, thereby can be removed.

8. A sheet flashing member as defined in any of the previous claims, wherein the sheet section (40) has a general longitudinal orientation, the pattern defining at least one indication (38) arranged at an oblique angle relative to the general longitudinal orientation, the oblique indication being directly or indirectly connected to a free edge (33, 35) of the sheet section.

9. A sheet flashing member as defined in any of the previous claims, wherein the sheet section (40) includes a main portion (10) and the first and second end portions define first and second corner segments (20, 30), the main portion comprising an upstanding flange (11) and the first and second corner segments comprising first and second flanges (21, 31) arranged substantially perpendicularly to the upstanding flange, the flanges (11, 21, 31) being adapted to engage a longitudinal surface portion of a roof penetrating building structure as well as its associated corner portions.

10. A sheet flashing member as defined in claim 9, comprising a skirt element (50) which can be adapted to engage an upper roof surface.

11. A sheet flashing member as defined in claim 9 or 10, wherein the first corner segment (20) comprises an indication (22) arranged across the

width thereof and generally perpendicularly to the  
general longitudinal orientation, and wherein the  
second corner segment (30) comprises first and second  
indications (32, 34) defining a portion (37), and a  
5 third indication (38) arranged at an oblique angle  
relative to the general longitudinal orientation and  
connected to said portion.



## A B S T R A C T

The flashing member comprises adaptable corner segments, which enables combined roof flashings to be  
5 provided in an economical and efficient way. An indication allows an adaptation of the corner segment by merely selecting between two different configurations for the corner segment, e.g. whether it is to be used between a window and the surrounding  
10 roof or between two neighbouring windows.

(Fig. 1)

. Fig. 1

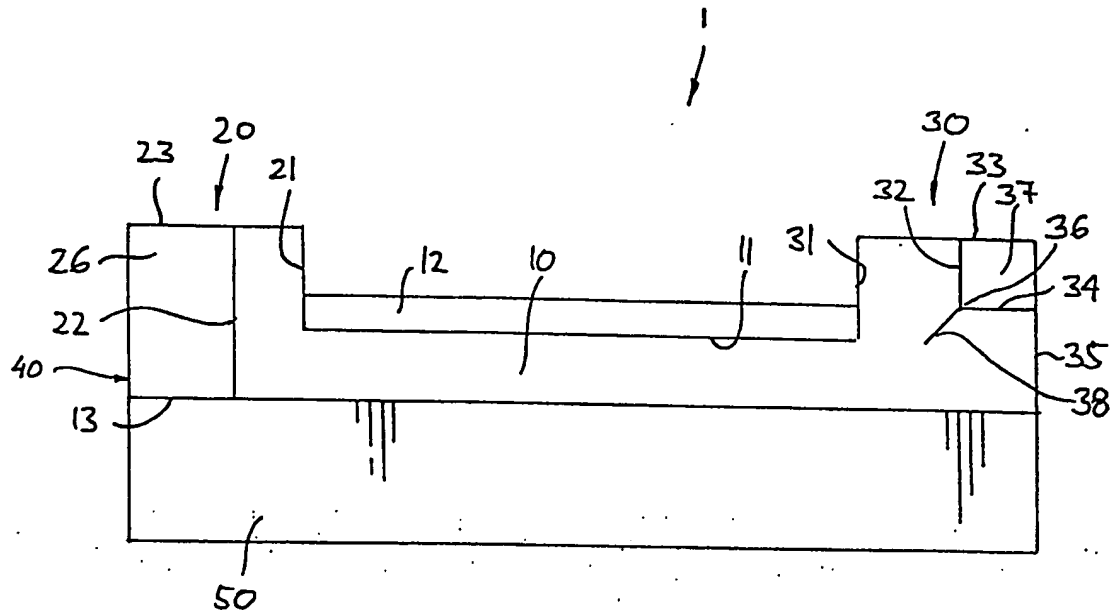


Fig. 2

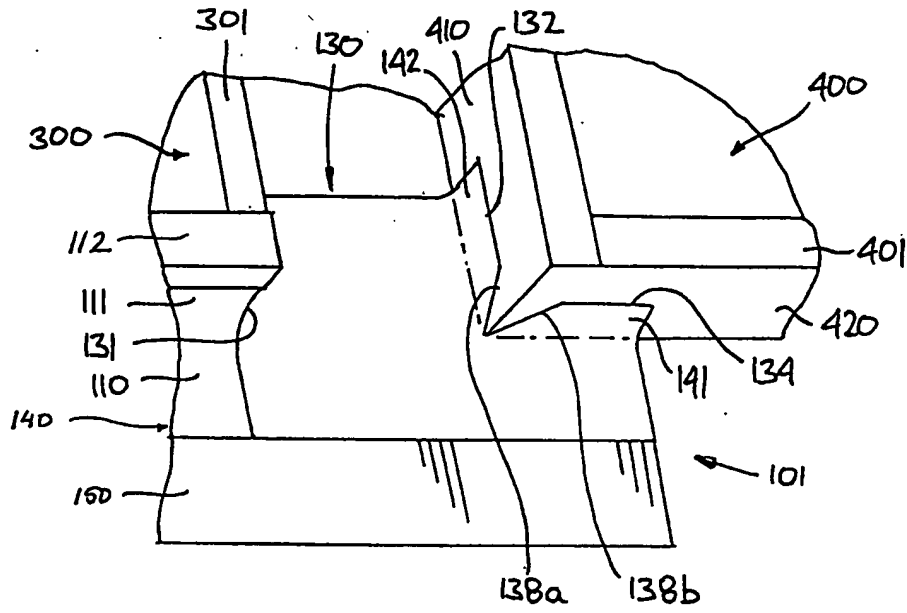


Fig. 3

